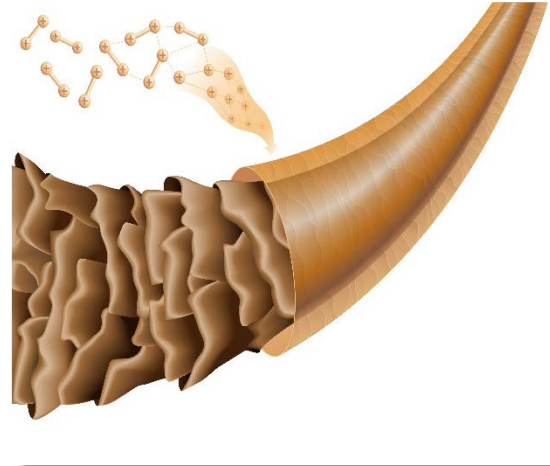


# ProCutiGen<sup>®</sup> Thermal Shield

Thermal Protection + Preventative Hair Care + Support



Tomorrow's Vision... *Today!*<sup>®</sup>

# ProCutiGen<sup>®</sup> Thermal Shield



## Technical Information

**Product Code:** 20828

**INCI Name:** Hydrolyzed Keratin

**INCI Status:** Conforms

**Suggested Use Level:** 1.0-10.0%

**Suggested Applications:** Thermal Protection, Nourishing

# ProCutiGen® Thermal Shield



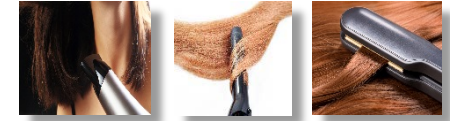
## Repair Beyond the Bond

- The “Plex Phenomenon” has swept the global haircare industry with products focused on bond multiplying or re-bonding
  - **525% increase in sales of bond multipliers between 2014 and 2015<sup>1</sup>**
- Current market is saturated with products claiming to re-bond the hair
  - Olaplex, L'Oréal Professional Smartbond, Bond Angel by Nutree Professional, Redken pH Bonder, Brazilian Bond Builder, etc.
- **Active Concepts** is shifting the focus to proactively protect the hair shaft through  
**“ProBonding”**
- **ProCutiGen® Thermal Shield** is an incredible scientific breakthrough that shakes the foundations of how we consider preventative hair care – repair beyond the bond.

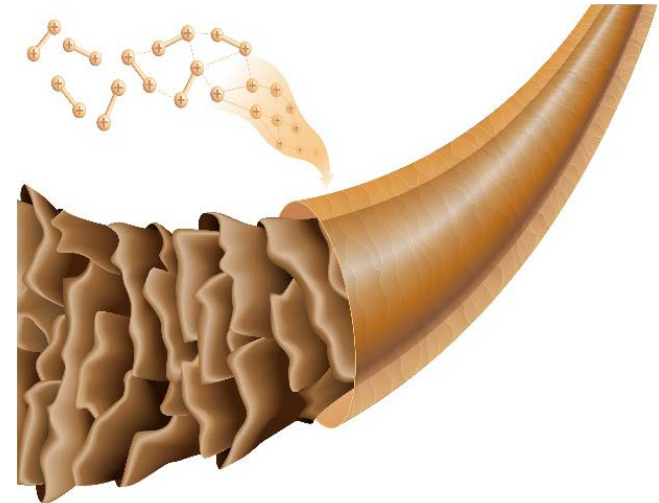
<sup>1</sup>Kline and Company. Salon Hair Care Global Series. 2016.

# ProCutiGen® Thermal Shield

## ProBonding Technology



- Our **ProCutiGen®** line of hair actives consists of bivalent cationic peptides that self assemble and effectively staple a unique film on to the hair cuticle
- The natural anionic charge of the hair attracts the cationic peptides
- The amino acid sequence of the naturally derived peptides dictates the nature of the film on the hair
- **ProCutiGen® Thermal Shield** is keratin derived



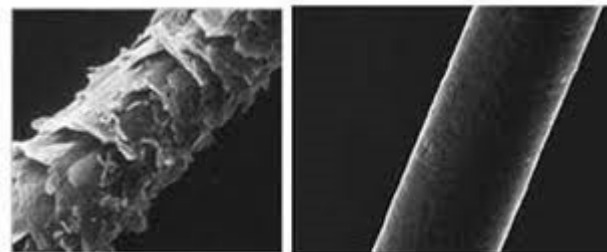
**Keratin = Strength and Protection**

# ProCutiGen® Thermal Shield

## ProBonding Technology



- Cuticle preservation is essential to prevent hair damage
- Damage to the cuticle compromises the structural integrity of the hair shaft, making hair prone to breakage
- Utilizing the concept of synthetic biology, **ProCutiGen® Thermal Shield** is a bivalent cationic lipopeptide that self-assembles into a neo-cuticle on the hair
- The formation of this biomimetic cuticle helps to retain style while offering protection from harsh styling treatments to promote healthy hair

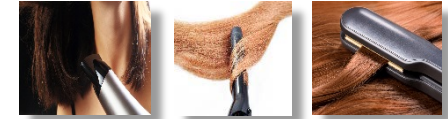


Damaged Cuticle

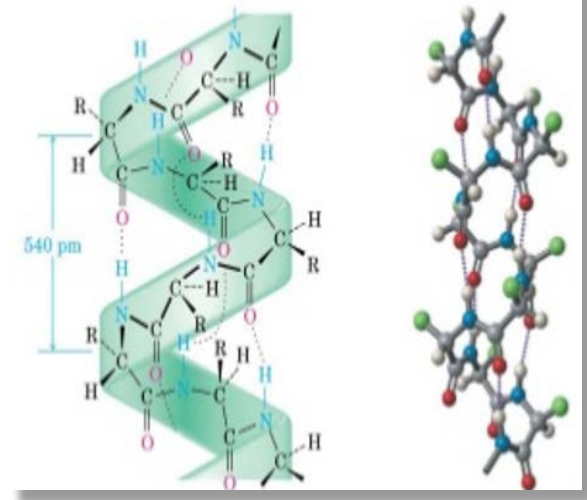
Healthy Cuticle

# ProCutiGen<sup>®</sup> Thermal Shield

## ProBonding Technology



- Thermal damage can strip moisture from the hair
  - Cracked cuticles
  - Brittle, dry appearance
- Hair needs a solid foundation to prevent damage
  - Building block of hair is keratin!
- Keratin makes up more than 90% of the hair follicle and is a source of strength and flexibility
- Keratin is rich in cysteine, a sulfur-containing amino acid that gives the protein its unique strength and protective quality



# ProCutiGen® Thermal Shield

## ProBonding Technology



- When hair undergoes heat styling or chemical processing, cysteine bridges are broken
  - Hair is left in a damaged, weakened state
- **ProCutiGen® Thermal Shield** is a lipopeptide derived from keratin, harnessing the natural strength of the protein for hair protection!



# ProCutiGen® Thermal Shield

## Benefits

- ✓ Thermal Protection
- ✓ Protects Hair
- ✓ Strengthens Hair
- ✓ Great for All Hair Types



Proactive. Protection. ProBonding.



# ProCutiGen® Thermal Shield

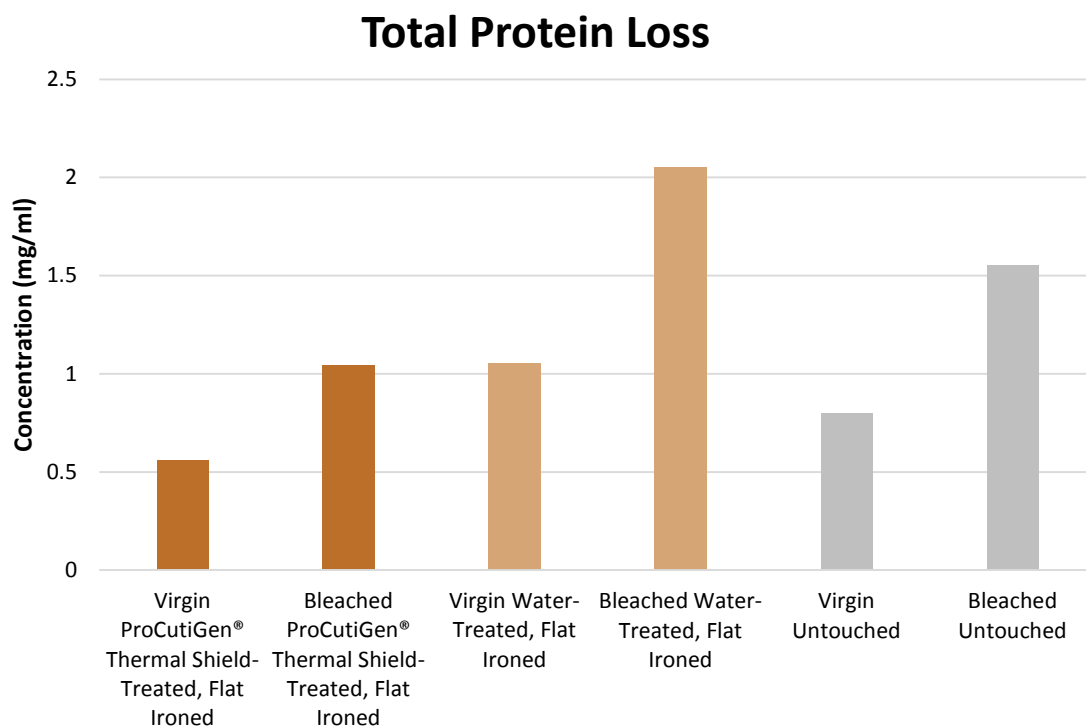
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## Thermal Protection Assay

- Quantitative measurements in the amount of protein removed from hair during heat styling can serve as a method to assess hair damage.
- Hair protein extraction, Bradford protein analysis, and protein gel electrophoresis were performed to assess the ability of **ProCutiGen® Thermal Shield** to protect hair from heat styling damage.
- The application of 2.0% **ProCutiGen® Thermal Shield** to both virgin and bleached hair followed by flat ironing helped to decrease the amount of protein lost, indicating that **ProCutiGen® Thermal Shield** is capable of preventing thermal damage.

# ProCutiGen® Thermal Shield

## Thermal Protection Assay



**Figure 1.** Concentration of extractable protein for each hair sample.

### Results

- The results demonstrate an increase in extractable protein obtained through bleaching and heat treatment
- 2.0% ProCutiGen® Thermal Shield to both virgin and bleached hair followed by flat ironing helped to decrease the amount of protein lost
- 2.0% ProCutiGen® Thermal Shield to virgin hair retained 60.9% more protein concentration during heat styling compared to water alone
- For bleached hair, the application of 2.0% ProCutiGen® Thermal Shield allowed the hair to retain 65.4% more protein, when compared to water alone

# ProCutiGen® Thermal Shield

## Thermal Protection Assay

### Comparative Protein Retention

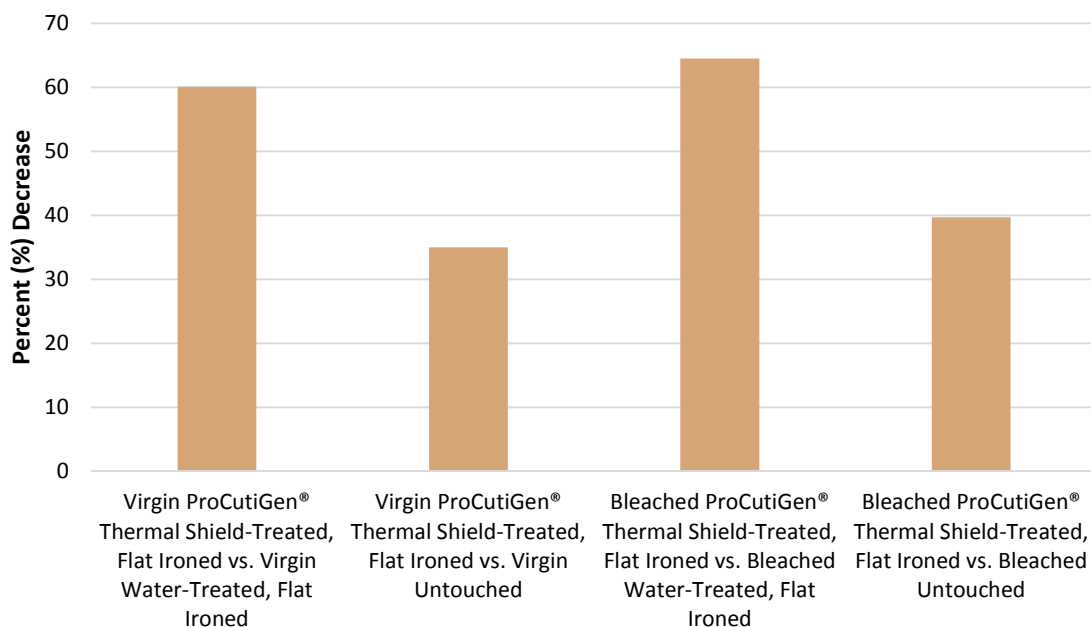


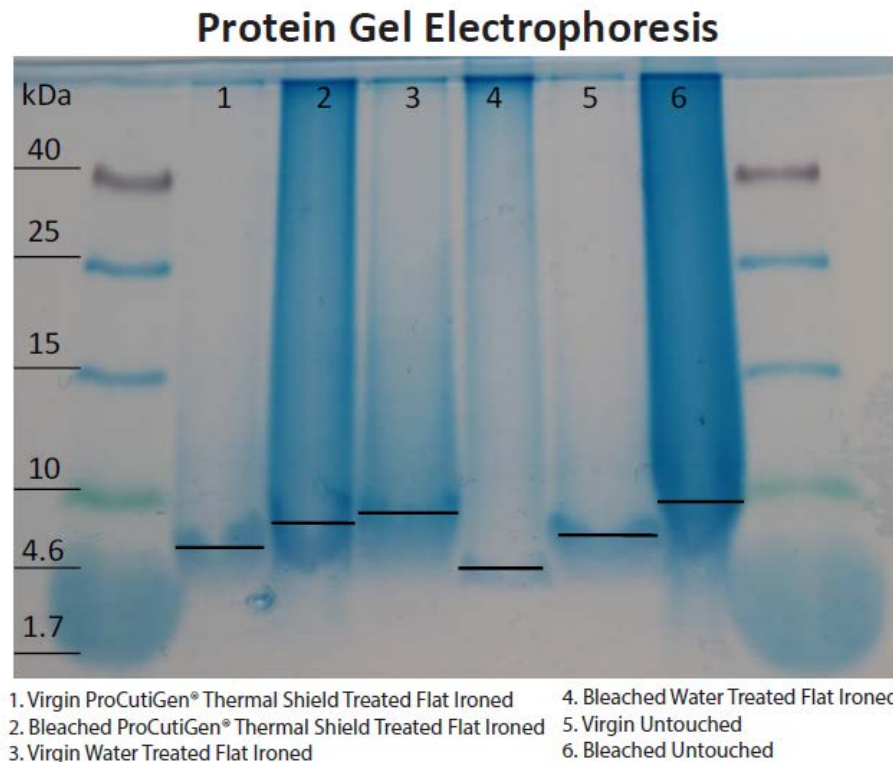
Figure 2. Comparative protein retention.

### Results

- The results demonstrate an increase in extractable protein obtained through bleaching and heat treatment
- 2.0% ProCutiGen® Thermal Shield to both virgin and bleached hair followed by flat ironing helped to decrease the amount of protein lost
- 2.0% ProCutiGen® Thermal Shield to virgin hair retained 60.9% more protein concentration during heat styling compared to water alone
- For bleached hair, the application of 2.0% ProCutiGen® Thermal Shield allowed the hair to retain 65.4% more protein, when compared to water alone

# ProCutiGen® Thermal Shield

## Thermal Protection Assay



**Figure 3.** Protein gel electrophoresis of hair samples.

### Results

- In Figure 3, the bleached hair samples in lanes 2, 4, and 6, exhibit an increased dye density
- This increased dye density correlates a higher amount of protein loss and consequential damage
- In hair samples with less damage, such as the virgin hair samples in lanes 1, 3, and 5, the hair follicle is less porous and releases a lower concentration of protein

# ProCutiGen® Thermal Shield

## Scanning Electron Microscopy

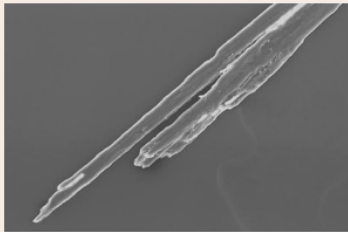
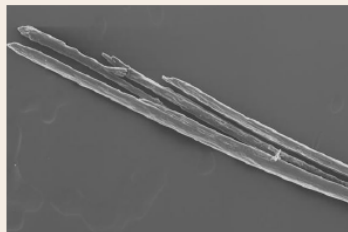
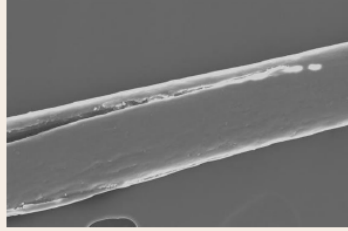
Swatch	SEM Image
Untreated Virgin Hair	
Water Treated + Blown Dry & Flat Ironed	
2.0% ProCutiGen® Thermal Shield + Blown Dry & Flat Ironed	

Figure 4. SEM Images.

### Results

- SEM images illustrate treating hair with **ProCutiGen® Thermal Shield** makes a difference at the microscopic level
- In the curled hair the cuticle is clearly damaged
- **ProCutiGen® Thermal Shield** shields each fiber and protects cuticle
- Depicts the ability of **ProCutiGen® Thermal Shield** to protect hair from damage associated with styling

# ProCutiGen® Thermal Shield

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## HIROX 3D Imaging

- Damage of the hair fiber can be seen within the following images in which the damaged areas of the fiber fluoresce
- Greater fluorescence corresponds to greater damage
- HIROX images were quantified via histograms
- HIROX Images were taken of curled hair
- Significantly less damage when using **ProCutiGen® Thermal Shield**
- The **ProCutiGen® Thermal Shield** treated fibers are more comparable to the untreated virgin fiber, showcasing **ProCutiGen® Thermal Shield's** ability to protect the hair fiber reducing overall damage to the hair

# ProCutiGen<sup>®</sup> Thermal Shield

## HIROX 3D Imaging

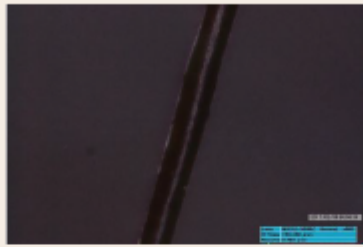
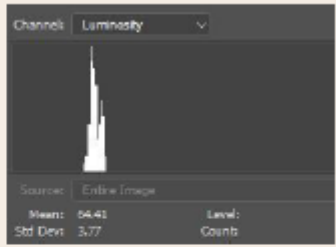
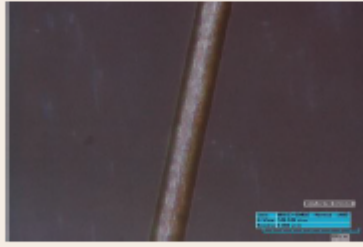
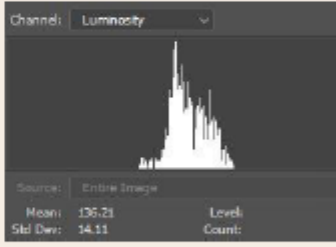
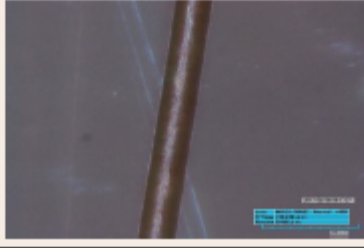
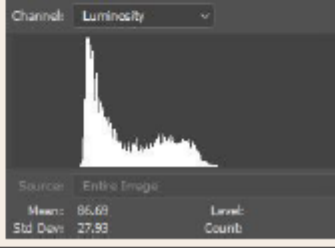
Swatch	HIROX Image	Histogram Quantification
Untreated Virgin Hair		 <p>Channel: Luminosity Source: Entire Image Mean: 54.41 Std Dev: 3.77</p>
Water Treated + Blown Dry & Flat Ironed		 <p>Channel: Luminosity Source: Entire Image Mean: 136.21 Std Dev: 14.11</p>
2.0% ProCutiGen <sup>®</sup> Thermal Shield + Blown Dry & Flat Ironed		 <p>Channel: Luminosity Source: Entire Image Mean: 86.69 Std Dev: 27.93</p>

Figure 5. HIROX results for thermal styled hair.

# ProCutiGen® Thermal Shield

## Product Recap



- **ProCutiGen® Thermal Shield** offers protection from heat styling and other thermal treatments to promote healthy hair cuticles
  - Creates a biomimetic cuticle on the hair
  - Protects hair
  - Prevents thermal damage
- **ProCutiGen® Thermal Shield** is an ideal ingredient for use in a wide range of hair care applications to protect hair against weakening after exposure to thermal processes

**Shaking the Foundations of Preventative Hair Care.  
Repair Beyond the Bond.**



# ProCutiGen<sup>®</sup> Thermal Shield



## Technical Information

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# ProCutiGen® Thermal Shield

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**THANK YOU**

For more information –Visit our website!

[www.activeconceptsllc.com](http://www.activeconceptsllc.com)